

creature shall be formed widely differing from anything before existing; that in this, as in everything else in Nature, there shall be gradation and harmony,—then these rudimentary organs are necessary, and are an essential part of the system of Nature. Ere the higher Vertebrata were formed, for instance, many steps were required, and many organs had to undergo modifications from the rudimental condition in which only they had as yet existed. We still see remaining an antitypal sketch of a wing adapted for flight in the scaly flapper of the penguin, and limbs first concealed beneath the skin, and then weakly protruding from it, were the necessary gradations before others should be formed fully adapted for locomotion. Many more of these modifications should we behold, and more complete series of them, had we a view of all the forms which have ceased to live. The great gaps that exist between fishes, reptiles, birds and mammals would then, no doubt, be softened down by intermediate groups, and the whole organic world would be seen to be an unbroken and harmonious system.

It has now been shown, though most briefly and imperfectly, how the law that "*Every species has come into existence coincident both in time and space with a pre-existing closely allied species*," connects together and renders intelligible a vast number of independent and hitherto unexplained facts. The natural system of arrangement of organic beings, their geographical distribution, their geological sequence, the phænomena of representative and substituted groups in all their modifications, and the most singular peculiarities of anatomical structure, are all explained and illustrated by it, in perfect accordance with the vast mass of facts which the researches of modern naturalists have brought together, and, it is believed, not materially opposed to any of them. It also claims a superiority over previous hypotheses, on the ground that it not merely explains, but necessitates what exists. Granted the law, and many of the most important facts in Nature could not have been otherwise, but are almost as necessary deductions from it, as are the elliptic orbits of the planets from the law of gravitation.

Sarawak, Borneo, Feb. 1855.

XIX.—*On some new Species of Hemipedina from the Oolites.*

By THOMAS WRIGHT, M.D., F.R.S.E.

SINCE the publication of our paper in the August Number of the 'Annals and Magazine of Natural History,' on the new genus *Hemipedina* and the Synopsis of the species included

therein, our friend S. P. Woodward, Esq., has kindly sent us three new English forms of this group, one found in the calcareous grit of Berkshire, and two in the Kimmeridge clay of Bucks; our friend Thomas Davidson, Esq., has likewise communicated a figure of one found by M. Bouchard Chantereaux some years ago in the Kimmeridge clay of Boulogne-sur-Mer; we lose no time therefore in recording these additions to the Oolitic fauna, at the same time returning our hearty thanks to the kind friends who have so liberally communicated the specimens.

A. *Species from the Calcareous Grit.*

Hemipedinæ Marchamensis, Wright, nov. sp.

Test large, and depressed; ambulacral areas narrow, with two rows of marginal tubercles, nearly as large as those of the interambulacra, extending regularly and without interruption from the peristome to the apical disc, and separated by a zigzag line of small granules down the centre, the areas retaining a nearly uniform width throughout; poriferous zones form a slightly waved line, from every three pairs of pores being set slightly oblique to the line of the zones; interambulacral areas four times the width of the ambulacral, with eight rows of tubercles at the equator, each tubercular plate supporting four nearly equal-sized tubercles abreast; bosses prominent; areolas surrounded with incomplete circlets of small granules; mouth-opening less than one-third the diameter of the test; peristome unequally decagonal; five jaws, *in situ*, each jaw having two broad flat central ridges, and two oblique marginal ridges with two intervening depressions; teeth long, and obliquely truncated at the points.

Dimensions.—Transverse diameter $2\frac{9}{10}$ inches; height $1\frac{3}{10}$ inch?

Locality.—The calcareous grit of Marcham, Berks.

Coll. The Hon. R. Marsham.

B. *Species from the Kimmeridge Clay.*

Hemipedinæ Morrisii, Wright, nov. sp.

Form and size unknown; test small; ambulacral areas with two rows of regular prominent marginal tubercles gradually diminishing in size from the base to the apex of the areas, and separated by a zigzag line of small granules down the centre; poriferous zones slightly waved; pores large, the pairs separated by thin septa; interambulacral areas more than three

times the width of the ambulacral, with six rows of tubercles at the equator, each plate supporting three nearly equal-sized tubercles abreast; bosses prominent; areolas surrounded by incomplete circlets of small granules.

Spines referred to this species long, round, slender, and sculptured with delicate longitudinal lines; articulating cavity small, with a smooth rim; head thick, with a thin prominent finely milled ring; body long, much more slender than the head.

Locality.—Kimmeridge clay, Hartwell, Bucks.

Coll. Professor Morris.

Hemipedina Cunningtonii, Wright, nov. sp.

Form unknown, upwards of an inch in diameter; ambulacral areas with two marginal rows of very small tubercles rather irregular in their mode of arrangement; poriferous zones nearly straight; interambulacral areas three times the width of the ambulacral, with two rows of tubercles situated on the zonal half of the tubercular plates, leaving thereby a wide intertubercular space which is filled with 8 to 10 rows of small granules; the bosses large and prominent, and the tubercles of a proportionate size; areolas surrounded by a complete circlet of small granules the same size as those filling the middle of the areas.

Locality.—Kimmeridge clay near Aylesbury. Collected by Professor Morris.

Coll. British Museum.

Foreign Species from the Kimmeridge Clay.

Hemipedina Bouchardii, Wright, nov. sp.

Test large, depressed; ambulacral areas with two rows of regular marginal tubercles extending without interruption from the peristome to the apical disc, and separated by a median zigzag line of small granules; poriferous zones straight; interambulacral areas three times the width of the ambulacral, with ten rows of tubercles at the equator, each tubercular plate having five tubercles abreast; areolas surrounded by circlets of small granules; spines slender, sculptured with longitudinal lines.

Dimensions.—Transverse diameter $2\frac{4}{10}$ inches?

Locality.—Kimmeridge clay, Boulogne-sur-Mer. Collected by M. Bouchard Chantereaux.

Coll. M. Bouchard Chantereaux at Boulogne.

In the present state of our knowledge it would be premature

to suggest subdivisions, but it is clear that we have two distinct types in the genus *Hemipedina*: 1st, those with two rows of large tubercles, and a wide intertubercular granulated space in the middle of the interambulacral areas; and 2nd, those with four, six, eight or ten rows of nearly equal-sized tubercles in these areas at the equator.

XX.--*Short Biographical Notice of the late Dr. JOHNSTON of Berwick-upon-Tweed.*

Not a twelvemonth has elapsed since our scientific public had to mourn the premature death of one of the most distinguished and amiable of its members. Cut off at an age when most men are but beginning to distinguish themselves, at a period of his life when he might have been expected to have even exceeded his previous admirable performances, and at the moment of his attaining a position in which his talents and kindliness of disposition might have exerted a most beneficial influence upon the rising generation of naturalists, the death of Edward Forbes produced a unanimous feeling of heart-felt regret amongst all who had received profit from his works, or enjoyed the pleasure of his personal acquaintance.

Scarcely nine months after the remains of Professor Forbes were carried to the tomb, we have again to lament the loss of another of the most distinguished naturalists of our country, Dr. George Johnston of Berwick-upon-Tweed; and although the light of this eminent man has not been extinguished at its noon, like that of the late Professor of Natural History at Edinburgh, he was still so far from the traditionally allotted period of human existence, and his most recent writings showed that the freshness and originality of his mind were so far from being impaired, that none could have anticipated that he was so soon to be taken from amongst us.

But it is not only as an eminent naturalist that Dr. Johnston has a claim upon the regard of the readers of the 'Annals,'—he possesses another title to their attention: from the first establishment of this Journal he was one of its conductors, and to the last moment of his existence he took an active interest in its progress. On this account, therefore, as well as from the interest which must necessarily attach to the history of a man of such great and varied attainments, we cannot allow his death to pass without consecrating a few pages to his memory, by recording the leading events of his quiet but eminently useful life.

Dr. Johnston was born at Simprin in Berwickshire on the 20th of July 1797. His father was a farmer, and was descended from a family, many members of which were well known on the